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EXAMINER

MARKOFF, ALEXANDER

ART UNIT

PAPER NUMBER

1746

DATE MAILED: 07/08/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/864,003

Applicant(s)

QINGYUAN ET AL.

Examiner

Alexander Markoff

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

***Response to Amendment***

1. The amendment filed 4/25/03 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: The recitation of the use of a gas composition with hydrogen concentration less than 5 percent by volume of the total composition.

The original disclosure fails to support such range limitation. It is noted that page 8 of the specification recites concentration of hydrogen being less than 5 percent. However, that concentration is the concentration of hydrogen in the forming gas, which is hydrogen gas mixture. The disclosed range is for the concentration of hydrogen in hydrogen-inert gas mixture not for the concentration of hydrogen in the plasma forming composition, as recited by Claim 22.

Applicant is required to cancel the new matter in the reply to this Office Action.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1- 22 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for specifically disclosed mixtures of plasma forming

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gases, does not reasonably provide enablement for a method of using a "neutral" plasma or a plasma wherein "an amount of the atomic oxygen species is about equal to an amount of the atomic hydrogen species". The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims.

It is noted that creating a mixture of more than 3% of hydrogen in oxygen gas will cause an explosion.

See US Patents No 5,773,201 (column 5) and 6,323,121 (column 2) as an evidence.

It is noted that the claims require forming plasma wherein "an amount of the atomic oxygen species is about equal to an amount of the atomic hydrogen species".

However, the disclosed examples are recite forming a plasma from a mixture comprising not more than 2.5% of hydrogen (the gas formed by an amount of oxygen and an equal amount of hydrogen-nitrogen mixture, in which hydrogen concentration is 5%).

Claim 22 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 22 requires the use of a plasma forming gas composition with hydrogen concentration less than 5 percent by volume of the total composition.

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The original disclosure fails to support such range limitation. It is noted that page 8 of the specification recites concentration of hydrogen being less than 5 percent. However, that concentration is the concentration of hydrogen in the forming gas, which is hydrogen gas mixture. The disclosed range is for the concentration of hydrogen in hydrogen-inert gas mixture not for the concentration of hydrogen in the plasma forming composition, as recited by Claim 22.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3 and 9-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Tao et al (US Patent No 6,242,350).

Tao et al teach a cleaning process utilizing the same gases at the same parameters (temperature, pressure, etc).

See entire reference especially columns 3-7.

***Claim Objections***

6. Claim 9 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is

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required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. This claim fail to further limit the previous claim because it only recites what is the neutral chemistry.

### ***Response to Arguments***

7. Applicant's arguments filed 4/25/03 have been fully considered but they are not persuasive.

The applicants argue that the rejection of claims under 35 USC 112 (1), presented in the previous Office action is not proper. The applicants further argue that undue experimentation would not be required.

This is not persuasive because the claims recite forming plasma with neutral chemistry, i.e. a plasma wherein "an amount of the atomic oxygen species is about equal to an amount of the atomic hydrogen species". Most of the claims are not limited to any specific concentration or recite concentration of 5% or less of hydrogen.

As it shown above, mixtures of hydrogen and oxygen are explosive. The claims recite the use of compositions which are explosive. For example, claim 22 specifically recites the use of the gas with concentration of 5% or less of hydrogen. It is known that creating a mixture of more than 3% of hydrogen in oxygen gas will cause an explosion.

The applicants state that level of hydrogen, which would cause the explosion depends on many parameters.

The examiner agrees with this statement and would like to point that the specification fails to provide teaching to enable an ordinary artisan to practice the invention commensurate in scope with the claims without explosion.

The applicants further state that the other gasses, such as hydrocarbons are not typically explosive at concentrations greater than 3%.

This statement is not supported and contradicts to the common knowledge that hydrocarbons-oxygen mixtures are explosive. See Hawley's Dictionary as an evidence of the fact that at least mixtures of methane and air are explosive at concentrations 5-15%. See also Handbook of Organic Solvents as an evidence that mixtures comprising 2.1-9.5% of propane in air would ignite at the temperature recited by the claims (450°C).

The examiner remains in the position that an ordinary artisan would not know which of the waste number of the gases recited by the claims and at which parameters could be used without explosion and thereby would not be able to practice the claimed invention without explosion without undue and risky experimentation.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Markoff whose telephone number is 703-308-7545. The examiner can normally be reached on Monday - Friday 8:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on 703-308-4333. The fax phone numbers for the organization where this application or proceeding is assigned are 703-

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305-7719 for regular communications and 703-305-7718 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0651.



Alexander Markoff  
Primary Examiner  
Art Unit 1746

am  
July 3, 2003

ALEXANDER MARKOFF  
PRIMARY EXAMINER